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## PERSPECTIVES

# Geriatric polypharmacy in Taiwan



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## Introduction

Older people often encounter several clinical situations requiring medical attention. Hence, optimizing the drug therapy has remained an art and posed a challenge to clinicians. Currently, there is no consensus on the definition of polypharmacy. Usually, having greater than five different prescriptions concomitantly is called polypharmacy and > 10 medications are often regarded as major polypharmacy.

In order to delineate medication use in older people in Taiwan, we searched PubMed, the Cochrane Library, and Embase to identify articles relevant to polypharmacy. The search terms included polypharmacy, geriatric, elderly, Asia, Taiwan, possible inappropriate medication, Beers criteria, Screening Tool of Older Persons' Prescriptions (STOPP), and behavior. Also, we appraised the existing Taiwanese clinical practice guideline for its quality and clinical applicability.

## Polypharmacy in Taiwan

Polypharmacy is frequently encountered in clinical settings. Of the aged Taiwanese population, 81.1% had received more than five prescriptions and 38.1% had major polypharmacy.<sup>1</sup> Moreover, over-the-counter (OTC) prescriptions, nutritional supplements and herbal remedies are categories that can't be neglected. In Taiwan, the low- to middle-income earners have a preference for the OTC medications and most of the self-reported health care choices are inconsistent with the actual behavior.<sup>2</sup> Half of aged Taiwanese (46% for men and 52% for women) took nutritional supplements regularly. It remains

an unresolved task to calculate the exact consumption of these remedies within society.

It is reported in Taiwan that polypharmacy endangers patients by increasing the rehospitalization rate of acute renal failure within 6 months, the incidence of peptic ulcer disease, hip fracture, and all fall-related fractures. In addition, it is related to the risk of cognitive impairment such as dementia [odds ratio (OR) 1.34, confidence interval (CI) 1.23–1.46] and Parkinson's disease (OR 2.95, CI 2.73–3.59).<sup>3,4</sup> Physicians' prescription behavior affects both the aged patients' cognition and physical function, short- and long-term.

## Consensus of inappropriate medication use

Although many safeguarding mechanisms to ensure drug safety have been developed, unfavorable outcomes resulting from medication use remain difficult to avoid. Clinical guidelines are intended to assist daily practice. The most cited explicit criteria, Beers criteria, was established by the American Geriatric Society. It serves as the clinical reference and has been modified into several different versions such as French, Italian, Japanese, and German versions. However, it is not optimally applicable to the Taiwanese society, as we do not share the same medications with the United States.

In 2010, by modifying seven guidelines including Beers, the McLeod, the Rancourt, the Laroche, the STOPP, the Winit-Watjana, and the Norwegian General Practice criteria and considering local medication availability, a group of experts developed the Potentially Inappropriate Medication-Taiwan criteria (PIM-Taiwan) recommendation.<sup>5</sup>

Despite many clinical criteria being available worldwide to aid medical decision-making, few were quantitatively evaluated for their contents. In this study, we evaluated the quality of PIM-Taiwan using the Appraisal of Guidelines Research & Evaluation (AGREE) II, modified in 2013, to assess.<sup>6</sup>

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**Table 1** The evaluation score of PIM-TW by AGREE II.<sup>6</sup>

Domains	Appraiser 1	Appraiser 2	(Mean/total) domain score (%)
Domain 1 <i>Scope &amp; purpose</i> is concerned with the overall aim of the guideline, the specific health questions, & the target population.	14	20	77.8
Domain 2 <i>Stakeholder involvement</i> focuses on the extent to which the guideline was developed by the appropriate stakeholders & represents the views of its intended user.	9	13	44.4
Domain 3 <i>Rigor of development</i> relates to the process used to gather & synthesize the evidence, the methods used to formulate the recommendations, & to update them.	26	47	59.4
Domain 4 <i>Clarity of presentation</i> deals with the language, structure, & format of the guideline.	13	18	69.4
Domain 5 <i>Applicability</i> pertains to the likely barriers & facilitators to implementation strategies to improve uptake, & resource implications of applying the guideline.	8	15	31.2
Domain 6 <i>Editorial independence</i> is concerned with the formulation of recommendations not being unduly biased with competing interests.	8	11	62.5
Rate the overall quality of this guideline.	4	5	
I would recommend this guideline for use.	Yes	Yes	

AGREE II = Appraisal of Guidelines Research and Evaluation II; PIM-TW = Potentially Inappropriate Medication-Taiwan criteria.

Two specialists evaluated the PIM-Taiwan independently (TYW, Geriatrician and YHW, Psychiatrist). The evaluators were blinded to each other's results and the evaluated scores are roughly consistent (Table 1). The PIM-Taiwan demonstrates the greatest strength in documenting the purpose and the aims. It has less power in describing the possible barriers and facilitators in a clinical setting (31%), in the statement of competing interests of development group members (38%) and in recruiting statistical professionals in the specialist group (44%). However, the PIM-Taiwan encompasses clinically explicit criteria and serves as an integrative modification of numerous clinical guidelines worldwide. Hence, it requires less statistical analysis. It is stated clearly in the criteria that regular updates will be followed, yet the PIM-Taiwan has not released any update since 2012.<sup>5</sup> Overall, PIM-Taiwan remains a useful tool clinically.

### Polypharmacy and physician behavior

Prescriptions mostly come from physicians' orders; therefore physicians' practice behavior is highly related to polypharmacy. Individuals who visit more doctors' clinics are prone to receive more medication. Single primary care physicians and single dispensing pharmacies may be "protective" in preventing inappropriate drug use.

In Taiwan, neuro-psychiatrists and family physicians have a propensity to prescribe multiple medication regimens. Additionally, doctors of medical centers are more likely to provide numerous medications simultaneously, probably because they encounter complex clinical cases more frequently.<sup>7</sup>

Continued medical education decreases the incidence of polypharmacy and reduces the incidence of inappropriate drug use. However, there are few Asian reports and none of these were conducted in Taiwan. With more education opportunities such as geriatric training or workshops, physicians are more confident with their prescriptions and are willing to review the medication periodically.<sup>8</sup> Comprehensive geriatric training is getting more important as populations age.

### Conclusion

Polypharmacy is an everyday scenario in clinical practice. Regarding the numerous guidelines worldwide, the PIM-Taiwan serves as a good guidance for medication use in the Taiwanese aged group. As an aging Taiwanese society is expected, preparation should be made.

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